

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents, comprising:

scanning a front side image and a back side image from the double-sided document, the front side image having portions, some of the portions including an original front image and a see-through back image from the a back side image;

storing at least the front side image and the back side image;

determining an edge amount for each of the portions in the front side image;

initially separating the see-through back image from the original front image based upon the edge amount to generate a first process result;

smoothing the portions having a certain amount of the edge amount in the first process result to generate a smoothed result;

further separating character portions and dot pattern portions from background in the smoothed result to leave background portions; and

correcting an intensity level of the character portions, the dot pattern portions and the background portions in the first process result using a corresponding predetermined conversion function so as to substantially eliminate the see-through back image.

2. (currently amended) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 1 22 wherein the character portions and the dot pattern portions are further separated from the background portion based upon binarizing the smoothed result.

3. (currently amended) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 4 21 wherein said further separating and said correcting steps are performed only when the front side image has an intensity level below a predetermined threshold value.

4. (currently amended) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 4 22 wherein the predetermined conversion function has a set of predetermined parameters for each pixel.

5. (currently amended) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 4 21 further comprising additional steps of:

determining an average intensity level among the portions of the front side image; and

determining a presence of a pitch frequency in the portions of the front side image;

wherein said further separating and said correcting steps are performed only when the following conditions are met, the average intensity level being below a predetermined threshold value, the edge amount being relatively small and the pitch frequency being present.

6. (original) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 5 wherein the presence of the pitch frequency is determined based upon the use of the distribution Fourier transformation.

7. (original) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 5 wherein the

presence of the pitch frequency is determined based upon the use of a self correlation function.

8. (original) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 5 wherein the presence of the pitch frequency is determined based upon the use of information on a peak and a valley of the front side image.

9. (currently amended) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 1 21 wherein said further separating and said correcting steps are performed at a set of predetermined levels based upon a user input.

10. (currently amended) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 1 21 wherein said further separating and said correcting steps are performed at a set of predetermined levels based upon an image quality level of the front side image.

11. (currently amended) A system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents, comprising:

a scanner for scanning a front side image ~~and a back side image~~ from the double-sided document, the front side image having portions, some of the portions including an original front image and a see-through back image from ~~the~~ a back side image;

a memory unit connected to said scanner for storing at least the front side image ~~and the back side image~~;

an edge amount determination unit connected to said memory unit for determining an edge amount for each of the portions in the front side image;

~~a smoothing unit connected to said edge amount determination unit and said memory unit for smoothing the portions having a certain amount of the edge amount in the first process result to generate a smoothed result;~~

~~a determination unit connected to said edge amount determination unit and said smoothing unit for initially separating the see-through back image from the original front image based upon the edge amount to generate a first process result, said determination unit further separating character portions and dot pattern portions from background in the smoothed result to leave background portions; and~~

~~a correction unit connected to said determination unit for correcting an intensity level of the character portions, the dot pattern portions and the background portions the first process result using a corresponding predetermined conversion function so as to substantially eliminate the see-through back image.~~

12. (currently amended) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim ~~11~~24 wherein said determination unit further separates the character portions and the dot pattern portions from the background portion based upon binarizing the smoothed result.

13. (currently amended) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim ~~11~~23 wherein said determination unit further separates the character portions and the dot pattern portions from the background and said correction unit corrects the intensity level only when the front side image has an intensity level below a predetermined threshold value.

14. (original) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 11 wherein the predetermined conversion function has a set of predetermined parameters for each pixel.

15. (currently amended) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 11 further comprising:

an average intensity level determination unit connected to said memory unit for determining an average intensity level among the portions of the front side image; and

a pitch frequency detection unit connected to said memory unit for determining a presence of a pitch frequency in the portions of the front side image;

wherein said determination unit further separates the character portions and the dot pattern portions from the background and said correction unit corrects the intensity level only when the following conditions are met, the average intensity level being below a predetermined threshold value, the edge amount being relatively small and the pitch frequency being present.

16. (original) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 15 wherein said pitch frequency unit determines the presence of the pitch frequency based upon the use of the distribution Fourier transformation.

17. (original) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 15 wherein said pitch frequency unit determines the presence of the pitch frequency based upon the use of a self correlation function.

18. (original) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 15 wherein said pitch frequency unit determines the presence of the pitch frequency based upon the use of information on a peak and a valley of the front side image.

19. (currently amended) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim ~~11~~23 wherein said determination unit further separates the character portions and the dot pattern portions from the background and said correction unit corrects the intensity level in response to a selected one value from a set of predetermined levels based upon a user input.

20. (currently amended) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim ~~11~~23 said determination unit further separates the character portions and the dot pattern portions from the background and said correction unit corrects the intensity level in response to an image quality level of the front side image.

21. (new) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 1 further comprising additional steps of:

smoothing the portions having a certain amount of the edge amount in the first process result to generate a smoothed result; and

further separating character portions and dot pattern portions from background in the smoothed result to leave background portions;

22. (new) The method of substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 21 wherein the intensity level of the character portions, the dot pattern portions and the background portion is corrected using a corresponding one of the predetermined conversion functions.

23. (new) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 11 further comprising:

a smoothing unit connected to said edge amount determination unit and said memory unit for smoothing the portions having a certain amount of the edge amount in the first process result to generate a smoothed result, wherein said determination unit further separates character portions and dot pattern portions from background in the smoothed result to leave background portions.

24. (new) The system for substantially eliminating the undesirable see-through back image problem in duplicating double-sided documents according to claim 23 wherein said correction unit corrects the intensity level of the character portions, the dot portions and the background portions using a corresponding one of the predetermined conversion functions.